DOCUMENT RESUME

ED 215 871 SE 037 061

AUTHOR Beckwith, Gwendolyn Long; And Others
TITLE Waukegan Behavior Analysis Follow Through Individualized Math Instruction Program: A Curriculum Manual for Teachers and Teacher Aides.
INSTITUTION Waukegan Community Unit School District 60, Ill.
SPONS AGENCY Office of Educational Research and Improvement (ED), Washington, DC. National Diffusion Network.
PUB DATE [79]
NOTE 79p.

EDRS PRICE MF01/PC04 Plus Postage.
DESCRIPTORS Curriculum Design; Curriculum Guides; Elementary Education; *Elementary School Mathematics; *Individualized Instruction; Instructional Materials; *Mathematics Curriculum; *Mathematics Instruction; *Program Descriptions; Validated Programs
IDENTIFIERS *Behavior Analysis Classroom; Heath Elementary Mathematics Series; National Diffusion Network Programs; *Waukegan School District IL

ABSTRACT

This document details aspects of the Waukegan Behavior Analysis Follow Through Program, designed for individualized instruction using Heath Elementary Mathematics textbooks. The guide contains five major sections. The first details the structure of the Heath series. Section two covers the process of student placement in the program. The third section contains: Preparing to Teach in a Behavior Analysis Classroom; Lesson Plans; Group Presentation of Concepts; Working in Books; and Recording Progress. Section four presents: How to Teach Math in a Behavior Analysis Classroom; Contacts; Concrete Materials for Instruction; Testing; Suggestions for Remediation; Red Line Procedures; Starred Words; and References. The final portion consists of eight appendices, titled: (A) Learning Objectives; (B) Trainee Checklist; (C) District Tests; (D) Page Correlations for Districts Tests; (E) General vs. Descriptive Praise; (F) Mathematics Back-up Activities; (G) Math Glossary; and (H) Follow Through Language. (MP)

****
* Reproductions supplied by EDRS are the best that can be made *
* from the original document. *
****

Individualized Math Instruction Program: A Curriculum Manual

ED215871

U.S. DEPARTMENT OF EDUCATION
NATIONAL INSTITUTE OF EDUCATION
EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)

✓ This document has been reproduced as received from the person or organization originating it.

Minor changes have been made to improve reproduction quality.

• Points of view or opinions stated in this document do not necessarily represent official NIE position or policy.

PERMISSION TO REPRODUCE THIS MATERIAL HAS BEEN GRANTED BY

HARRY S. BOWEN

TO THE EDUCATIONAL RESOURCES INFORMATION CENTER (ERIC)."

SE 037 041

Waukegan Behavior Analysis Follow Through

Individualized Math Instruction Program

A Curriculum Manual

For Teachers and Teacher Aides

DON T. TORRESON
Superintendent
Community Unit School District No. 60
Waukegan, Illinois

George W. Latham	Assistant Superintendent for Admin. Services
Harry S. Bowen	Associate for Supportive Services
James Capra	Assoc. for Curricular & Instructional Services
Chet R. Johnson	Associate for Pupil Personnel Services
Roman P. Miller	Associate for Business Affairs

BOARD OF EDUCATION

John B. Della Valle, President

Pamela Bernardi

Warren Hadad

Stanley Leckie

James Maurice

John F. Rickerd

Nellie Suggs

FOLLOW THROUGH PROGRAM

Harry S. Bowen	Director
Isabelle L. Buckner	Assistant Director
Merle Holzman	Coordinator

RESOURCE CENTER

Gwendolyn Beckwith	Resource Center Staff Trainer
Kitty Shumaker	Resource Center Specialist

Acknowledgements

This manual is a result of a joint effort of the following individuals:

Gwendolyn Long Beckwith

Thelma Williams

Eva Williams

Janet Eppers

Ruby Curtis

Mary Davis

Kathy Fitzgerald

Merle Holzman

Kitty Shumaker

A special thanks goes to Kathy Fitzgerald for typing and co-editing this manual.

Very special appreciation is extended to The University of Kansas Behavior Analysis Follow Through staff, particularly Marji Stivers and Randy Lee Williams for co-editing and publishing this manual, to Opal Folks for typing the final draft and to Kitti Limpiuasrisakul for producing the cover design.

Preface

The Waukegan Behavior Analysis Follow Through Program was implemented at Carman Elementary School in the fall of 1969. Behavior Analysis Follow Through was designed by Don Bushell and his colleagues at The University of Kansas to meet the educational needs of low-income students in kindergarten through third grade. The model emphasizes the basic skills of reading, math, spelling, and handwriting. In 1977, Waukegan's program was validated by the standards and guidelines of the United States Office of Education and National Institute of Education as being an effective and exemplary education program for children from low-income families and approved for national dissemination by the Joint Dissemination Review Panel. Funding for the development as well as the dissemination was through U.S.O.E. Follow Through grants.

Brochures describing the Waukegan Behavior Analysis Follow Through Program are available to interested parties free of charge. Upon request, an Awareness Day will be arranged. Visitors will be provided with an introduction and orientation to the program, an opportunity to observe team teaching in the classroom, presentations on parent participation and comprehensive services, and the opportunity to ask questions.

Districts interested in adopting the program may obtain relevant information from the Project Director.

Table of Contents

Introduction i

Section One: Structure of the Heath Math Series 1

Section Two: Placement 4

Section Three: Preparing to Teach in a Behavior Analysis Classroom 7

- Lesson Plans 7
- Group Presentation of Concepts 8
- Working in Books 9
- Recording Progress 10

Section Four: How to Teach Math in a Behavior Analysis Classroom 11

- Contacts 11
- Concrete Materials for Instruction 13
- Testing 16
- Suggestions for Remediation 17
- Red Line Procedures 19
- Starred Words 22

References 23

Section Five: Appendices 24

- Appendix A Learning Objectives 25
- Appendix B Trainee Checklist 40
- Appendix C District Tests 41
- Appendix D Page Correlations for Districts Tests . . . 43
- Appendix E General vs. Descriptive Praise 50
- Appendix F Mathematics Back-up Activities 52
- Appendix G Math Glossary 63
- Appendix H Follow Through Language 65

INTRODUCTION

This curriculum manual is a joint effort of many staff members who have taught Heath Elementary Mathematics in Behavior Analysis classrooms. It contains a useful description of the Heath math series and a thorough set of prescriptions for applying well-tested Behavior Analysis teaching techniques to classroom instruction in Heath Math.

Section I describes the structure of this curriculum series. Section II explains how to determine student placement in the curriculum. Section III provides information on how to prepare to teach Heath Math in a Behavior Analysis classroom. Section IV gives specific information on specific procedures for Behavior Analysis teaching of Heath Math.

This manual is designed to assist the teacher aide and the lead teacher while in training. However, it should continue to be a valuable source of reference to trained staff members in Behavior Analysis classrooms.

SECTION ONE: STRUCTURE OF THE HEATH MATH SERIES

The Heath Elementary Mathematics series consists of seven books beginning with the K book and ending with Book 6. The books do not correspond to grade levels in Behavior Analysis since each child works at his own pace.

The Heath books are divided into chapters. Each chapter covers related math concepts. At the end of each chapter there is an in-book test titled "Chapter Checkup". The Heath books with soft covers are consumable; the children can write their answers in the book. Levels 3-6 contain a cumulative review at the end of each chapter, titled "A Major Checkup." "Keeping Skills Sharp" is a feature in the Heath Series which appears periodically to review skills which have previously been introduced. When working in the books with hard covers, children write their answers in spiral notebooks. Heath also publishes supplemental worksheets and tests in the form of duplicating masters. Figure I gives a summary description of the materials that are included in the series.

A Teacher's Manual to correlate with each book is also provided in the Heath Series. These manuals are used primarily for reviewing the concepts taught in each chapter and for specific directions and hints on teaching specific math concepts. The Heath Series also provides lists of necessary materials needed for the chapters, "Excursions" (challenges for more able students), and a list of new terms in the teacher's manuals. An added benefit in each Heath

Teacher's Manual is a Scope and Sequence Chart. This chart will help a math teacher understand how the preceding text leads into the present one. Topics printed in red ink denote a new concept while topics printed in black ink have been introduced previously.

DESCRIPTION OF HEATH BOOKS

Level K

yellow cover
94 pages
soft cover
duplicating masters for
worksheets & tests

Level 1

red cover
242 pages
soft cover
duplicating masters for
worksheets & tests

Level 2

Magenta cover
284 pages
soft cover
duplicating masters for
worksheets & tests

Level 3

Purple cover
329 pages
hard cover
duplicating masters for
worksheets & tests

Level 4

Blue cover
348 pages
hard cover
duplicating masters for
worksheets & tests

Level 5

Green cover
325 pages
hard cover
duplicating masters for
worksheets & tests

Level 6

Blue cover
Hard cover
344 pages
duplicating masters for
worksheets & tests

Fig. 1

SECTION TWO: PLACEMENT

Entry Placement of Students

In an individualized instruction classroom, the teacher (math) aide uses the following procedures to determine entry placements of students:

Kindergarten

Kindergarten children usually begin school with few math skills. Children with no math skills will start with developmental concrete language oriented activities to build basic concepts such as larger/smaller, shape identification, number concepts, and counting skills.

Students with at least one year of Behavior Analysis Experience.

If a child comes to your room who has previously been in Behavior Analysis Follow Through, the best source of placement information is the Bi-Weekly Individual Progress Report (BIPR). The coordinator or teacher aide trainer can provide BIPR information for any student who comes to you within the program. Prior to placement in a Heath Math Book, the teacher should give skill review lessons to the student. The skill review lesson should cover the math skill objectives that the teacher finds appropriate for the student. The math aide is responsible for developing the skill review lessons. The lessons can include worksheets or exercises from the Heath Math Guide. After the student's skills have been reviewed, the student should return to the proper placement according to the BIPR. Give the last chapter test preceding his/her place-

ment to determine concept retention. If a student is not able to master the skill review lessons and/or the tests, tutoring sessions will be necessary.

Transfer Students

For transfer students, administer the Placement Test (available at the Waukegan Follow Through Office) chapter by chapter until the child's performance indicates that he/she needs instruction in the material covered in a chapter. (See sample test.) At this stage, give the preceding chapter test to determine accurate placement. If the child gets at least 80% of the problems correct, he is properly placed. If his score is less than 80%, give the preceding tests until a level of 80% accuracy is achieved. Start the child at the point in the book where 80% accuracy is reached. The above process may be used at the beginning or any other time of the school year.

For a student in the first grade level with no math skills, the teacher uses the same procedure as kindergarten. (See above.)

Placement Test

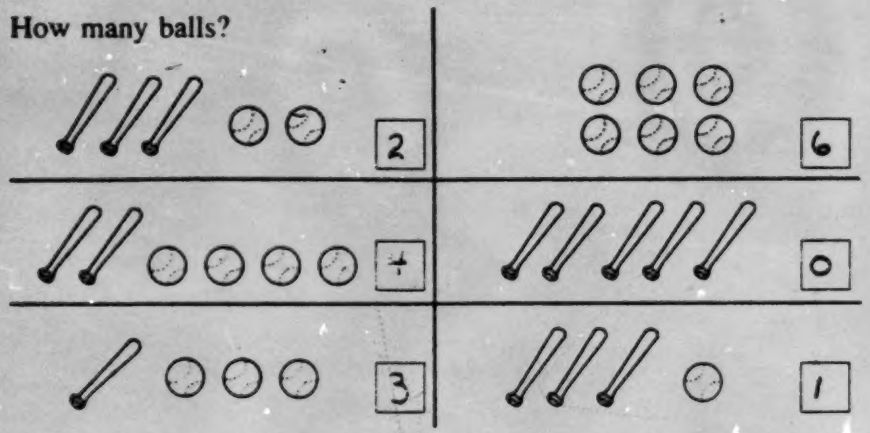
NAME _____

DATE _____

Chapter 1

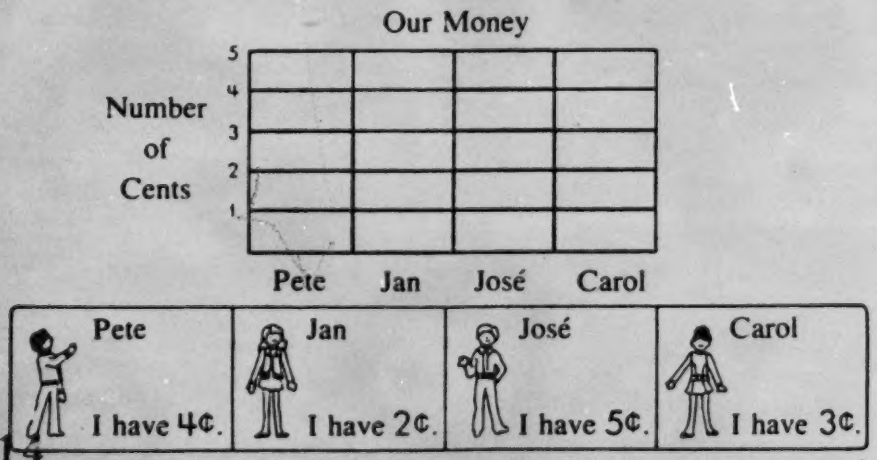
Part A

How many balls?



Part B

Draw the bars on the bar graph.



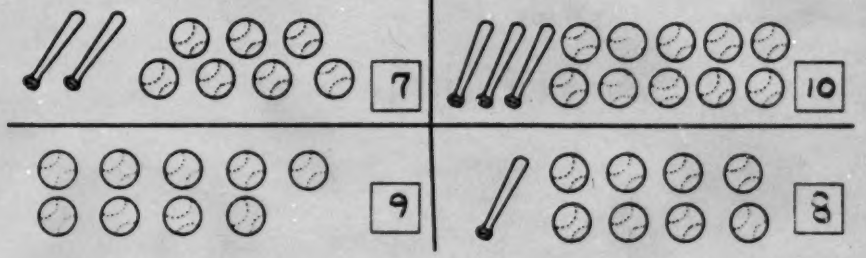
Copyright © 1975 by D. C. Heath and Company

NAME _____

Chapter 2

Part A

How many balls?



Part B

What is the correct sign, < or >?

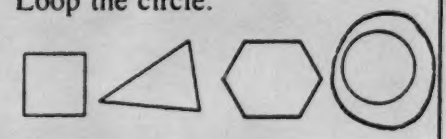
7 (>) 5 10 (>) 9 6 (<) 8

Chapter 3

Part A

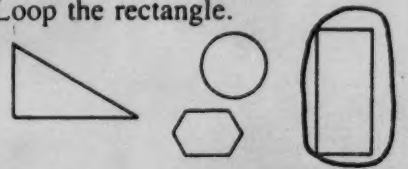
Loop the figure.

Loop the circle.

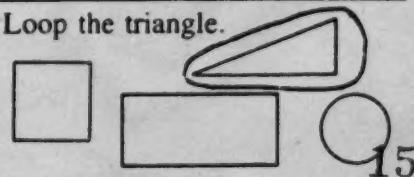


Loop the square.

Loop the rectangle.



Loop the triangle.



Copyright © 1975 by D. C. Heath and Company

T21

SECTION THREE: PREPARING TO TEACH IN A BEHAVIOR ANALYSIS CLASSROOM

Teachers and aides preparing to teach in a Behavior Analysis Classroom must realize that they will not teach as they have previously been taught. There must be a break with your past experience. The security of large group teaching--presentation of a concept or a lesson with accompanying assignments to be completed and checked by the teacher--is a thing of the past. In your Follow Through class, it will be replaced by a series of small steps in teaching and learning. Teaching, learning, checking, reteaching, and relearning are necessary to prevent a child from working a large group of math exercises incorrectly. No longer do you keep children in a group where they are all held to the same level of progress. Instead, you can learn to handle a group where children may be at many different levels. You will not give a child a set amount to accomplish daily, but rather, determine the amount based on his or her own rate of learning. This method of teaching can be very rewarding as you see so many children come closer to realizing their own potential.

LESSON PLANS

1. Read the teacher's manual for suggested teaching techniques and ideas on how to establish continuity between previously learned concepts and new concepts.

2. Familiarize yourself with the vocabulary for each concept. Keeping a cumulative card file of vocabulary words is a good review for students.

3. Stay a chapter ahead of your fastest student so that you'll always be prepared.

4. Keep in mind the cognitive level of your students; that is, try to "think like a second grader," etc.

5. Prepare lesson plans for presentations including the information below: student objectives, purpose of lesson (concept), concrete materials to be used and vocabulary covered. This will be helpful both in the event that you are absent and to ensure yourself that you are adequately prepared to teach each day.

6. Review each week's lesson plans with your lead teacher. She is responsible for all activity in the classroom and should be a valuable helpmate in guiding your duties as a math teacher. A sample lesson plan is included.

7. Star new concept skills and concepts in books.

TUESDAY

Student objectives: Students can use the terms is greater than and is less than to compare two numbers. Students can use the signs) and (to write inequalities
Purpose of lesson: Reintroduce the concepts greater than and less than and the associated symbols) and (.
Materials: flannelboard, objects and yarn, beads and spindles (or shoelaces), & counters for children.
Vocabulary: greater than, less than

Intro: Display two sets on the flannelboard. You may want to show them with loops of yarn. Have the children tell which set has more and which set has fewer objects. You can use lengths of yarn to pair the objects.

Follow the same procedure with beads. Have one child string nine beads on one shoelace and have one child string six beads on another shoe lace. Ask which child is holding the greater number of beads (or which is holding the least number.

GROUP PRESENTATION OF CONCEPTS:

1. Give daily presentations that will benefit the largest number of students. Be flexible; occasionally direct presentations to fastest or slowest students. Use tutoring time for presentations to students far ahead or far behind the rest of group in placement.

2. Present concepts slightly ahead of placement of the majority of students.

3. Emphasize vocabulary and teach vocabulary as sight words.

4. Use and demonstrate the proper use of concrete materials to present concepts.

WORKING IN BOOKS

1. Relate workbook materials to presentations.

2. Assign red lines (marks to show completion of assignment) so that all students have equal opportunities to earn tokens. When children are beginning new or difficult concepts, make sure that red lines are sufficiently short to avoid frustration.

3. Review material before each red line to make sure that the child understands the concepts and format.

4. Urge the children to use concrete materials until they and you are confident of their understanding of a concept.

5. Constantly monitor students' work to minimize number of incorrect responses and subsequent frustration.

6. At completion of red lines, ask child to verbalize the operation that he/she performed to check for concept attainment.

RECCRDING PROGRESS

In your lesson plan book, or Daily Classroom Schedule, record page numbers daily; this not only facilitates filling out BIPR* sheets but also gives a day-to-day breakdown of progress. You may want to circle two-week BIPR target* pages in students' books so that they (and you) can pace themselves on a daily basis. Keeping track of daily targets need not be a pressured situation for students.

*BIPR: Bi-Weekly Individualized Progress Report

*Target: An individualized preset number of pages that a child is to complete in a specified length of time.

SECTION FOUR: HOW TO TEACH MATH IN A BEHAVIOR ANALYSIS CLASSROOM

In order to teach math in the Behavior Analysis Classroom, you must familiarize yourself with the teacher's manual including the glossary and the appendix. You will then know how to use the math aids, and most of all, how to explain new problems and how to introduce new concepts to the students. (See previous section on "Preparing to Teach".)

When you begin to teach, arrange students in a table-line manner so that you can see all students at the same time. Start working with the first student who is ready (the student who raises his hand first).

CONTACTS

Contact the students who are on-task. Give general praise to the student, followed by prompting, then give descriptive praise (stating exactly what the child did). Always leave the student with a praise statement.

Ignore off-task students; praise the student who is near to the off-task student for working.

Make many short maintenance contacts with children who are working independently. Be sure to make these contacts when you are engaged in a lengthy monitoring contact by looking up and praising those children who are working. (This is why it is important to arrange your desks so you can see all of the children all the time.)

Make monitoring contacts to check a child's work. This can be done in two ways. One is to give a child an assignment and check his work when that assignment is completed. Another way is to check a child's work as he completes it, making brief contacts with children often and checking their work in short segments. This second way is probably more efficient, since it eliminates long checking contacts. It is very important to ask the children questions about what terms mean ("What does the minus sign tell you to do?"), how mathematical problems are read ("Read this problem, please."), and how problems are worked. Give tokens and praise for answering these questions correctly and for getting written answers correct. Require children to correct answers that are incorrect.

Make trouble contacts when a child raises his hand and says, "Teacher, I need help." In these cases, you will probably need to explain how to work a problem. Refer to the boxed examples in the book and read through the problem. Be very careful to praise when making trouble contacts. Most teachers do a great job of praising children during monitoring and maintenance contacts, but when they are explaining problems, they often give a series of prompts ("Now add that column. Put your ones here. Now put your tens here," etc.) and leave a child without praising him once. Remember to praise whenever a child does something you have asked him to do, even if it is "Go ahead and work to the next page." As soon as the child starts working the next page say "Good, you're getting started!"

CONCRETE MATERIALS FOR INSTRUCTION

"Learning by doing" is one of the most effective teaching techniques practiced, especially in the education of young children. By performing arithmetic operations such as addition, subtraction, and regrouping using physical devices, a child can more readily visualize how such operations work. Beginning with concrete and basic examples of concepts allows for future understanding of the concept in a more abstract setting. For this reason, the use of concrete manipulative devices aids the student (and consequently the teacher) in learning basic math skills in the Behavior Analysis classroom.

Encourage students to use concrete devices during their earn periods and keep manipulatives readily available. The suggestions below are some ways that teacher aides have used concrete devices. With a little imagination, you will find devices and uses suited to your own unique teaching style.

Counting Sticks

Good for conceptualizing counting, addition, and subtraction.

Use for visualizing "tens and ones".

For building the concepts of "ten more" and "ten less", by adding or subtracting a bundle.

For working with the concept of regrouping in both addition and subtraction.

Blocks

Concrete manipulatives for basic counting, addition, and subtraction.

Since the blocks are 1" square, they are useful in establishing the relationship 12" = 1' (Also a good manipulative in a problem such as 15" = 1' + ___?___").

In conjunction with egg cartons, the blocks can be used to determine fractions of one dozen; e.g., cartons divided into fourths, thirds, and halves by colors.

Good for visualizing the concept of Area = length x width.

Pegboard

Good for beginning multiplication facts, e.g., three sets of four pegs = 3 x 4 = 12.

Fraction Wheels

(Circles on construction paper divided into halves, thirds, sixths, etc.)

Great for finding fraction of numbers, i.e., "What is one-third of 9?", when used with markers.

When used with clear plastic overlays, they help strengthen concepts of fractions such as 2/3, 4/5, etc.

Also with plastic overlays, equivalent fractions can be illustrated.

Cardboard Cutouts of Cups, Pints and Quarts

With equivalent measurements printed on back, these reinforce liquid measurements without spilling.

Clear Plastic Cups with Small Plastic Beads

Good parallel formatting of Heath Book 1 for addition, subtraction, and missing addend problems.

Especially useful when students are beginning addition with three addends. (If you make sure to use only square beads, a lot less of them will land on the floor.)

Cardboard Thermometer

(With changeable red ribbon "mercury")

Gives practice in reading temperature. A real thermometer outside the classroom adds meaning.

Cardboard Calendar

(With changeable months, days and years)

Students are responsible for changing calendar each month.

3-D Cardboard Geometric Shapes

Helpful as children are learning the names and physical characteristics of different geometric shapes.

Flannel boards

Help with concepts such as larger and smaller, more and less, and for practice in repeating geometric patterns.

Number lines

For use in addition, subtraction, skip counting, and adding together sums of money.

Special number lines such as "twos" or "threes" skip count number lines are helpful in early multiplication.

Real Coins or Play money

Give practice in counting money.

Giant cardboard coins provide a novel alternative.

Abacus

Can be used for place value problems when labeled "ones", "tens", hundreds", etc.

Good for helping children count amount of "change" from purchase. For example, if a problem indicates that a child has 14¢, he can count out 14 markers and "spend" (subtract) seven of them to "purchase" a 7¢ eraser. (Books 1, 2, & 3.)

Cardboard Clockfaces

Valuable manipulatives when children are learning to tell time.

Coupled with self-correcting time flashcards they provide excellent independent or small group practice.

TESTING

In order to evaluate the effectiveness of instruction and the level of the student's conceptual grasp, Heath has included a set of dittoed chapter tests with its instructional materials.

The proper time to administer chapter tests is after the child has successfully completed the chapter "Checkup." (The checkup may be used as a review page and as an indicator of concepts requiring remediation prior to the test.) When administering the test, the teacher aide may only read directions and provide requested concrete manipulatives; no coaching on tests is allowed. Scoring is done after completion of test; during testing period tokens* are given for on-task behavior.

In order to move on to the next chapter, students are required to perform at a level of 80% or above accuracy; if the student fails to do so, remediation techniques should be used until the child is

*Token: A chip given to child for good work or good behavior which is later exchanged for a back-up activity.

ready to attempt the test again. In order to facilitate remediation, the beginning of each section of the chapter test lists the page numbers of the concepts covered.

Because Heath provides two alternate forms of each chapter test, more accurate retesting results are achieved than if only one test form were available. For example, when testing, use chapter test Form A. If retesting is required, use Form B. Both forms test mastery of the same concepts with slightly different problems.

Since children perform best in a non-threatening environment, it is important for both student and teacher to maintain a positive attitude toward testing. Although students should be encouraged to do their best, failure to meet the required accuracy level should be regarded as a means to determine remediation rather than a personal defeat.

SUGGESTIONS FOR REMEDIATION

When a child's test or daily performance indicates that he/she is having difficulty grasping a concept, remediation is necessary. Suggestions for remediation are listed below:

1. Basic and supplementary worksheet dittos accompany the Heath text. Consult your teacher's guide for proper use of these worksheets.

2. Occasionally use group presentations for remediation purposes instead of presentation of new topics. This is especially useful when several group members are having difficulty with the same concept.

3. Use appropriate math games to add interest and strengthen math skills. These games can either be commercially or teacher prepared.

4. Consult the teacher aide trainer for further advice. Your lead teacher and training classroom instructor may also provide helpful suggestions.

5. Arrange special tutoring time with your lead teacher. Each classroom should have special time set aside on a regular basis for tutoring. Since sometimes the same students are having diffifulty in both math and reading, cooperative "sharing" of tutoring time may be necessary.

Some Considerations about Remediation:

To help the child reach his progress target, try to have remediation materials in addition to rather than instead of regular work. Try to arrange special tutoring time for your students so that they may work toward their targets during regular earn time.

Make remediation as stimulating as possible--it should not be a punitive experience. Your job is to make math as enjoyable and interesting as possible; this is a particular challenge when a student experiences difficulty.

Be flexible in your approach--if one teaching technique fails to reach a student, try another. Use concrete manipulatives whenever possible.

RED LINE PROCEDURES

Teachers and aides will place red lines after a specific number of pages in each child's book. In order to determine the appropriate red line intervals for the children, it is necessary to initially standardize the number of responses between red lines for each group. Depending on the book placement and material, red lines should occur after every one or two pages for an entire group of children. After a period of adaptation, the number of responses in the standard red line interval for a group should be individualized for each student. These decisions should be based on the accuracy of work and the rate at which red line intervals are completed. For some students, the intervals will remain the same; for others, they will be decreased. However, for a majority of students, the red line interval will be increased. The general strategy is to increase periodically, but cautiously, the size of the red line intervals for every student.

Utilization of the red line procedure to insure frequent contacts with each student is most desirable. Be careful that you do not fall into the habit of stopping to contact one student for an extended period of time, thus stifling the progress and learning of the other students in the group. By keeping your red line intervals brief until a student has mastered a concept or format, you avoid his establishing an ineffective pattern of work. A child can undertake one item of a small section more easily than a whole

page when he/she is not very familiar with a concept or procedure. The student is much more encouraged by this method since it is very likely to establish a successful work pattern for the student.

Check each student's work at every red line so that all checking is done by the end of the period and there is no carry-over from day to day. You are expected to record each student's final page placement daily after the end of the last earn. With this placement and the red line checks, you can set individual objectives for your students and plan for group presentations. As pages are completed, some math teachers okay and initial them in the upper outside corner of the page. When the child begins to work in an earn period, a teacher can quickly flip through his book to see if all the pages up to that point have been completed. Students sometime have a tendency to skip pages in their books; initialing pages is good insurance against this problem.

Every time a student is contacted for reaching a red line, he/she should be prompted by the teacher to explain some of the work just completed. If the student cannot explain approximately two problems to you while you are checking his or her work, this should tell you the child does not understand the concept and needs additional help.

Reward as many positive behaviors as possible. Some examples of these behaviors are the following: raising the hand, neatness, clear writing of numerals, oral responses, correct use and pronuncia-

tion of mathematical terms, evidence of concepts, slow careful work or speedy and accurate work. Always encourage your students whenever possible.

CHART OF RECOMMENDED TOKEN DELIVERY SYSTEM

Curriculum	Raised Hand	Oral Accuracy	Correction	Written Accuracy
Math	One token immediately after you check to see that the child has reached the red line (after raising hand)	One token for corrctly verbalizing a problem	For children's corrections in materials, tokens should not be delivered, only teacher's verbal praise.	Tokens for 100% accuracy during first check

STARRED WORDS

In addition to the red line procedure used in Behavior Analysis, red stars are incorporated into the teaching of math. Red stars can be placed by those problems which introduce new skills or concepts.

Instruct the children to raise their hands when they reach red stars. As a general rule, praise the children for correct responses at red stars, but do not deliver tokens for concepts that you model. Also, before leaving a child after the contacting at a red star, require at least one correct response; otherwise, there is no guarantee that the child understood your instructions or explanation.

Red stars should be placed in each student's book before the school year has started or at least in enough time to allow the flow of instruction to continue without needless interruption. After the math teacher aide has determined what pages contain new problems or concepts there will be no difficulty in starring all students books quickly and effortlessly.

References

Dilley, C. A., Walter, E. R., and Jackson, A. E. Heath Elementary Mathematics, D. C. Heath and Company, Lexington, Mass., 1975.

A List of Behavior Analysis Follow Through Program Manuals Available from The University of Kansas.

The Behavior Analysis Classroom

Tokens for the Behavior Analysis Classroom: A Teaching Guide

Behavior Analysis Certification: How to Become Certified as a Behavior Analysis Specialist

Behavior Analysis Certification: Observation and Training Procedures for the Staff Trainer

A Guide to Staff Training

Computer Feedback in the Behavior Analysis Classroom: A User's Guide

SECTION FIVE: APPENDICES

APPENDIX A

LEARNING OBJECTIVES

LEARNING OBJECTIVES-KINDERGARTEN BOOK

1. Indicate a one-to-one correspondence between sets.
2. Understand the use of the words more, fewer, most, and fewest in relation to sets of elements.
3. Determine which of several objects is tallest, shortest, longest, largest, and smallest.
4. Select circles, squares, and triangles from a collection of figures.
5. Reproduce simple patterns.
6. Count the elements in a set that have 10 or fewer elements.
7. Match the proper standard numerals with sets of 10 or fewer elements.
8. Put in order the numbers 1 through 10.
9. Draw sets with 1 to 10 elements.
10. Select regions that are one-half shaded.
11. Point out first and last elements in an ordered set.
12. Identify points that are inside or outside a curve.

LEARNING OBJECTIVES-Level 1

Upon completion of Level 1, all students should be able to do the following:

1. Match equivalent sets one-to-one.
2. Point out the larger (smaller) of two similar objects.
3. Determine which set has more (fewer) elements.
4. Count the objects in a set (up to 100).
5. Make and read simple bar graphs.
6. Determine which of several objects is largest (smallest).
7. Determine which of several objects is tallest (shortest).
8. Write inequalities involving numbers up to 100.
9. Determine whether two shapes are the same or different.
10. Identify squares, circles, triangles, and rectangles.
11. Draw segments joining selected points.
12. Determine whether a curve is closed or not closed.
13. Given a picture showing two sets of elements being joined, write an addition equation relating the numbers of members in the two sets to the total number of members.
14. Given numberline pictures of addition facts, write the addition equations.
15. Given numberline pictures of subtraction facts, write the subtraction equations.
16. Tell time to the hour and half-hour.
17. Put in order the numbers up to 100.
18. Give the value in cents of a collection of pennies and dimes when the value is less than one dollar.

LEARNING OBJECTIVES-Level 1 (cont.)

19. Given a collection of dimes and pennies and a value in cents less than one dollar, select coins having the given value.

20. Given two addends and their sum, write two addition equations and two subtraction equations.

21. Given a collection of nickles and pennies whose value is less than 10¢ give the value.

22. Given a collection of nickles and pennies and a value in cents that 10¢ or less, select coins having the given value.

23. Measure lengths using arbitrary units. (Paper clips).

24. Measure lengths using centimeters and inches.

25. Measure capacity using liters, cups, pints, and quarts.

26. Make conversions among cups, pints and quarts.

27. Give from memory the addition and subtraction combinations for sums to ten.

28. Give from memory or by counting the basic addition facts for sums 11-18.

29. Give from memory or by counting the basic subtraction facts for sums 11-18.

30. Give regions divided in two, three or four equally large parts, shade 1/2, 1/3, or 1/4 respectively of the regions.

31. Given a set of at most six objects, loop 1/2 or 1/3 of the objects.

32. Select from a collection of regions those that are 1/2 or 1/4 shaded.

33. Add two one or two digit numbers whose sum is less than 100 when no regrouping is involved.

34. Subtract any one or two digit numbers when no regrouping is involved.

LEARNING OBJECTIVES-Level 1 (cont.)

35. Add two quantities of money whose sum is less than one dollar when no regrouping is involved.

36. Subtract two quantities of money each less than one dollar when no regrouping is involved.

LEARNING OBJECTIVES-Level 2

1. Count the elements of sets containing up to ten elements.
2. Given two numbers, each less than ten, tell which is greater.
3. Tell which element in an ordered set is first, second, third, fourth, fifth, sixth or seventh.
4. Read data from a bar graph when the numbers involved are ten or less.
5. Write a missing addend in an addition equation.
6. Find the sum of three addends when the sum is ten or less.
7. Count collections of bundles of ten and single objects and write the numbers in standard form for numbers less than 100.
8. Count by ones starting at any number that is less than 100.
9. Determine which of two numbers less than 100 is greater.
10. Given a number less than 90, write the number that is ten greater.
11. Given a number greater than 90, write the number that is ten less.
12. Count by fives or tens to 100.
13. Write the value in cents of a collection of pennies and dimes when the value of the collection is less than one dollar.
14. Recall from memory all basic addition facts.
15. Recall from memory all basic subtraction facts.
16. Solve simple word problems by using basic addition or subtraction facts.
17. Measure lengths with a centimeter ruler.
18. Measure lengths with an inch ruler.
19. Measure lengths with a meter stick.
20. Measure with a foot ruler.

LEVEL 2 OBJECTIVES-Level 2 (cont.)

21. Read thermometer scales.

22. Measure liquid using a liter container.

23. Make conversions among cups, pints, and quarts.

24. Find the value of a collection of pennies, nickles, dimes when the value is less than one dollar.

25. Subtract two numbers each less than 100 whether or not regrouping is required.

26. Find the value of any collection of pennies, nickles, dimes, and quarters when the total value is less than one dollar.

27. Draw a segment joining two given points.

28. Determine if two segments have the same length.

29. Use a rectangular card to determine if corners of figures are square.

30. Select from a set of figures those that are squares, rectangles, triangles or circles.

31. Determine by tracing if two figures are the same shape and size.

32. Given a region partly shaded, write a fraction that tells what part is shaded.

33. Given a region divided into parts and a fraction, shade the region to represent the fraction.

34. Tell time on the hour, half-hour, and quarter-hour.

35. Given a set of discrete objects some of which have a given characteristic, write a fraction that tells what part of the set has that characteristic.

36. Given a set of discrete objects and a fraction, loop enough of the objects to represent the given fraction of the set.

37. Count objects that are grouped into hundreds, tens, and ones and record the numbers in standard form.

LEARNING OBJECTIVES-Level 2 (cont.)

38. Read standard numbers with up to three digits.

39. Add any two-digit numbers.

40. Add two three-digit numbers when there is regrouping from ones to tens.

41. Subtract two or three digit numbers when there is regrouping from tens to ones.

42. Given several equivalent sets, write a multiplication equations relating the number of sets, the number in each set, and the total number of members.

43. Given a numberline picture of several equivalent jumps, write a multiplication equation relating the number of jumps, the length of each jump and the final landing point.

44. Generate from memory or by using physical objects the products for basic multiplication exercises in which one factor is two, three or five.

45. Solve word problems by simple multiplication.

LEARNING OBJECTIVES-Level 3

After completing Level 3, all students should be able to do the following:

1. Given any number less than 90, tell the number that is ten greater.
2. Given single objects, groups of ten objects, and groups of one hundred objects, write in standard form the number of objects.
3. Given a pair of numbers each less than 1000, write an equation or inequality about the numbers.
4. Given an ordered line of at most ten elements, tell which element is first, second, etc.
5. Given a collection of dollars, pennies, nickles, dimes, quarters, and half-dollars, write the value.
6. Given a collection of objects grouped into tens, hundreds, and thousands, write the number of objects in the collection.
7. For numbers less than one billion, read the standard numeral.
8. Interpret a bar graph.
9. Given a number less than one billion in word form, write it in standard form.
10. Recall from memory the basic addition facts for sums zero through 18.
11. Recall from memory the basic subtraction facts for sums zero through 18.
12. Add three one-digit numbers when the sum is less than 18.
13. Measure lengths to the nearest centimeter.
14. Measure lengths to the nearest inch, half-inch, and quarter-inch.
15. Given a region covered by a square grid, find the area of the region by counting squares of the grid.
16. Tell time in five-minute intervals.

LEARNING OBJECTIVES-Level 3 (cont.)

17. Given a value less than one dollar and pictures of quarters, dimes, nickles, and pennies, loop a set of coins that has the given value.

18. Add any two or three whole numbers with up to two digits.

19. Subtract numbers with up to three digits when no regrouping is involved.

20. Check a subtraction problem by addition.

21. Subtract three-digit numbers when one regrouping is involved.

22. Given two or more equivalent sets or a numberline picture involving several jumps of the same length, write a related multiplication equation.

23. Recognize even numbers less than 50.

24. Given two or more equivalent sets, write related division equations.

25. Given a pair of factors and their product, write two multiplication and two division equations relating the numbers.

26. Recall from memory all basic multiplication facts.

27. Recall from memory all basic division facts.

28. Recognize and draw line segments.

29. Given a polygon, name each of its sides.

30. From a collection of figures, select those that are triangles, quadrilaterals, rectangles, and squares.

31. Determine by tracing if two figures are congruent.

32. Given a pair of congruent figures, write the fitting.

33. Given a fitting of a pair of congruent figures, list the pairs of corresponding parts.

34. Given a figure, determine if the figure has lines of symmetry and draw the lines of symmetry if they exist.

LEARNING OBJECTIVES-Level 3 (cont.)

35. Given a region partly shaded, write a fraction that indicates what part of the region is shaded.

36. Given a set of discrete objects some of which have a common characteristic, write a fraction that indicates what part of the set has that characteristic.

37. Given a numberline with zero and one labeled and some evenly spaced points between zero and one, label those points with fractions.

38. Write at least one fraction equivalent to a given fraction.

39. Find a unit fractional part of a quanity.

40. Give at least three multiples of any one-digit number.

41. Given division exercises in vertical form, write the quotients.

42. Given several equivalent sets together with another set with fewer elements, write a multiplication-addition equation about the sets and their elements.

43. Solve all basic division-with-remainder problems.

44. Measure using meters, decimeters, and centimeters.

45. Make conversions among kilometers, meters, decimeters, and centimeters.

46. Measure using yards, feet, and inches.

47. Make conversions among yards, feet, and inches.

48. Read weight scales graduated in kilograms and in pounds.

49. Weigh objects to the nearest kilogram and to the nearest pound.

50. Estimate areas of regions by placing over the region a grid of squares and counting squares.

51. Find volumes of solid figures composed of cubical blocks by counting the blocks.

52. Measure the amount of liquid a container holds in cubic centimeters, liters, cups, pints, and quarts.

LEARNING OBJECTIVES- Level 3 (cont.)

53. Given a circle with its center, measure the diameter and the radius.

54. Read thermometer scales to the nearest degree.

55. Multiply a two-digit number by a one-digit number with or without regrouping.

56. Multiply a three-digit number by a one-digit number.

LEARNING OBJECTIVES-Level 4

After completing Level 4, all students should be able to do the following:

1. Count up to 1000 objects and write the number in standard form.
2. Given two numbers with six or fewer digits, write an equation or inequality about the numbers.
3. Read standard form numerals for numbers through the millions.
4. For numbers through the millions, change word form to standard form.
5. For a number less than 40, change Roman numerals to Hindu-Arabic numerals.
6. For numbers less than 40, change Hindu-Arabic numerals to Roman numerals.
7. Find the sum of three or more single-digit numbers.
8. Add any two whole numbers.
9. Add any three two-digit numbers.
10. Subtract any two whole numbers.
11. Solve word problems by addition or subtraction.
12. Measure lengths to the nearest centimeter.
13. Make conversions among the following metric units for measuring length: centimeter, decimeter, meter, and kilometer.
14. Measure to the nearest eighth-inch.
15. Make conversions among the following English units for measuring length: inch, foot, yard, and mile.
16. Measure the area of a region by placing over it a grid of squares and counting the squares that cover the region.
17. By counting the blocks, find the volumes of figures made of cubical blocks.

LEARNING OBJECTIVES-Level 4 (cont.)

18. Weigh objects on metric or English scales.

19. Measure the capacity of a liquid container to the nearest liter and to the nearest cup.

20. Given several equivalent sets, write a multiplication equation relating number of sets, the number of elements in each set, and the total number of elements.

21. Given a picture of several equivalent numberline jumps, write a multiplication equation relating the number of jumps, the length of each jump, and the total distance jumped.

22. Recall from memory the basic multiplication facts (to 9 x 9).

23. Given several equivalent sets, write two division equations that relate the number of sets, the number of elements in each set, and the total number of elements.

24. Recall from memory the basic division facts.

25. Solve word problems involving basic multiplication and division facts.

26. Given a region partly shaded, write a fraction that tells what part of the region is shaded.

27. Given a set of discrete objects some of which have a given characteristic, write a fraction that tells what part of the set has the given characteristic.

28. Label points on the numberline with fractions.

29. Write at least three fractions that are equivalent to a given fraction.

30. Add or subtract with fractions having the same denominator.

31. Add or subtract with fractions having different denominators.

32. Find a fractional part of a quantity.

33. Solve word problems involving finding fractional parts of quantities.

LEARNING OBJECTIVES-Level 4 (cont.)

34. Multiply any two or three-digit number by a one-digit number.

35. Multiply any number with up to three digits by ten or 100.

36. Multiply any number with up to three digits by a two-digit multiple of ten.

37. Multiply any number with up to three digits by a two-digit number.

38. Solve word problems by addition, subtraction or multiplication.

39. Given several equivalent sets and another set with fewer elements, write a multiplication-addition equation for the total number of elements.

40. Solve all basic division-with remainder problems.

41. Divide a number with up to three digits by a one-digit number, with or without regrouping.

42. Solve word problems using addition, subtraction, multiplication or division.

43. List three multiples of any number.

44. Select from a list those numbers that are even.

45. List all the factors of any number that is less than 50.

46. From a list of numbers that are less than 50, point out those that are prime.

47. For a pair of numbers each less than 50, list all common factors.

48. Reduce fractions to lowest terms.

49. Estimate sums by rounding the addends and adding.

50. Estimate differences by rounding and subtracting.

51. Estimate products by rounding the factors and multiplying.

52. Label points on the numberline with mixed numerals.

LEARNING OBJECTIVES-Level 4 (cont.)

53. Change mixed numerals to fractions.

54. Change fractions to mixed numerals.

55. Add or subtract, using mixed numerals whose fraction parts have the same denominator and when no regrouping is involved.

56. Add or subtract with mixed numerals when their fraction parts have different denominators and when no regrouping is involved.

57. Select the segments from a collection of figures.

58. Select from a collection of figures those that are triangles, quadrilaterals, parallelograms, rectangles, squares, kites or trapzoids.

59. Determine whether two figures are congruent.

60. Given a fitting of two congruent figures, list the corresponding parts.

61. Determine whether a given line is a line of symmetry of a given figure.

62. Draw all lines of symmetry of a given figure.

63. Select from a collection of figures those that are rays, lines or angles.

64. Select from a collection of lines those that are perpendicular and those that are parallel.

65. Select from a collection of angles those that are right angles.

66. Divide a number with up to four digits by a two-digit number.

67. Solve word problems.

APPENDIX B

TRAINEE CHECKLIST

Before completing training you will:

- ☐ Be familiar with the proper way to use Heath Math Manuals.
- ☐ Understand how and when to use tutoring time.
- ☐ Complete Behavior Analysis test, Token Manual test, Heath Manual test, Math Glossary test, Handbook test, Handwriting test and Spelling test (3rd grade).
- ☐ Understand relationship between red lines and token exchange. (K-2nd grade)
- ☐ Be able to set contracts (3rd grade).
- ☐ Complete two sample math lessons plans and execute the presentations.
- ☐ Be able to follow proper placement procedure.
- ☐ Construct a math game and use it with the class as a spend activity (explain math concepts
- ☐ Construct a spend "menu" and direct token exchange (or completion of contracts)
- ☐ Be able to fill out BIPR and interpret progress reports.
- ☐ Sketch three bulletin boards and state concepts involved.
- ☐ Know how to run off and prepare dittomasters.
- ☐ Complete test analysis form.
- ☐ Understand the administration procedure for Heath and District Tests.

APPENDIX C

DISTRICT TESTS

Waukegan Public School District 60 has compiled a list of specific, level-by-level mathematics skills that students are expected to acquire in the district math programs. These skills have been outlined and correlated with specific math series used in the district in the Continuum of Math Skills. To evaluate the mastery of these objectives, a set of criterion referenced tests has been devised to accompany each book (level) in the mathematics series used. To record the mastery of the objectives, Goal Cards are to be acquired for each student (obtainable from the Waukegan Follow Through office). District criterion-referenced tests are to be given after certain pages in the Heath texts, as is indicated by the following sheets.

SETTING UP YOUR DISTRICT TESTING SYSTEM

Proper organization is a crucial factor in establishing an efficient and easy to use system of administering district tests. Although each aide establishes her own system best suited to her tastes and needs, the following method is offered as an example:

Using the continuum correlation (included in this manual) that corresponds with each child's book level, go through students' books and star each page that is to be followed by a district test. This will be a helpful reminder to both you and your students.

SETTING UP YOUR DISTRICT TESTING SYSTEM (cont.)

Again using the correlation sheet, set up a file system of the district tests by page number. For example, if the continuum correlation sheet indicates that district test S.N.O.-6 is to be given after page 21, then this page will be starred in each student's text. After this page is completed, you (or the student) will go to the test file box and remove test S.N.O.-6 from the folder marked page 21. After the test is completed, it can be collected and scored at a later time. If you also alphabetize the students' goal cards, recording of test results will also be simplified.

The ease of this system arises from the option of allowing students to locate their own tests. If students are acquainted with this system, many of the tests will require little, if any, explanation by the teacher aide. For tests that specify direction by the teacher, a special notation such as a checkmark can be made upon the test to alert the student to contact his teacher aide for further instruction.

APPENDIX D

PAGE CORRELATIONS FOR DISTRICT TESTS

Book K

CHAPTER	AFTER PAGE	TESTS
(Book K contains no chapter designations)	1	A/S,N,0/1
	14	A/S,N,0/2
	17	A/S,N,0/10
	20	A/S,N,0/9
	57	A/S,N,0/8
	64	A/S,N,0/4
	69	A/Geom./2
	82	A/S,N,0/11
	86	A/Meas./1
	90	A/Geom./1
	94	A/S,N,0/3,5,6

PAGE CORRELATIONS FOR DISTRICT TESTS (cont.)

BOOK 1

CHAPTER	AFTER PAGE	TESTS
1	14	B/S,N,0/12
	38	B/S,N,0/3
2	52	B/S,N,0/1
	53	B/S,N,0/27
3	74	B/Geom/4
	76	B/Geom/3
	78	B/Geom/1,2
4	---	None
5	151	B/Meas./1
	160	B/S,N,0/13,14
	161	B/S,N,0/17
	162	B/S,N,0/2.16,19
	163	B/Sent./5
	165	B/S,N,0/20,21,22
	174	B/Meas./2
6	186	B/S,N,0/8
	198	B/S,N,0/10
	200	B/S,N,0/4
	201	B/Meas./8
	207	B/Meas./4
	209	B/S,N,0/6,7
7	212	B/Meas./5
	219	B/Meas./10
	220	B/Meas./9
	222	B/Meas./6
8	237	B/Meas./3
9	247	B/S,N,0/24
	250	B/S,N,0/23
	254	B/Geom./6
10	---	None
11	270	B/Sent./4
	277	B/S,N,0/25
	282	B/S,N,0/26

PAGE CORRELATIONS FOR
DISTRICT TESTS (cont.)

BOOK 2

CHAPTER	AFTER PAGE	TESTS
1	9	C/GRS/1
	14	C/SNO/7
2	48	C/SNO/13
	50	C/SNO/10
3	85	C/SNO/1,2
4	118	C/Sent./1,2
	130	C/SNO/8,14
	131	C/SNO/9
5	144	C/Meas./1
	151	C/Meas./11
	152	C/Meas./10
	153	C/Meas./6
6	---	None
7	193	C/Meas.2,3
8	201	C/Geom./1
	202	C/Geom./7
	206	C/Geom./2
	210	C/Geom./5
	213	C/Geom./4
	214	C/Geom./8 (1-4)
9	219	C/SNO/16
10	234	C/SNO/5
	238	C/SNO/4
	240	C/SNO/3
	248	C/SNO/12
11	270	C/SNO/6
	279	C/SNO/15
	281	C/Sent./3

Extras:

C/Geom./3
C/Geom./6
C/Meas./4
C/Meas./5

PAGE CORRELATIONS FOR DISTRICT TESTS (cont.)

BOOK 3

CHAPTER	AFTER PAGE	TESTS	
1	3	E/SNO/6	
	8	E/SNO/3	D/SNO/3
	9	E/SNO/2	D/SNO/1
	11		D/Meas./5
	14	E/SNO/1	D/SNO/2
	19	E/Sent./2	
	23	E/SNO/4	D/SNO/16
	24	E/SNO/5	
2	44		D/Sent./2
3	70	E/Meas./5	
	71		D/Meas./12
	75	E/Meas./6	
	83		D/Meas./1,2
4	96		D/SNO/4
	105		D/SNO/5,6
	107		D/Meas./6,7
	119	E/SNO/8	
5	125		D/Meas./9
	130		D/SNO/7
	132		D/SNO/11
	133		D/SNO/12
	137		D/SNO/8
	138		D/SNO/9,10
6	154	E/SNO/12	
	166	E/Sent./1	E/SNO/11
	167	E/SNO/9,10	
	168	E/Sent./4	
	177	E/Sent./1	
7	193		D/Geom./1
	195		D/Geom./4
	198		D/Geom./6
	199		D/Geom./3
	201		D/Geom./5
	202	E/Geom./7	
	208		D/Geom./8
	215	E/Geom./9	
8	217	E/SNO/7	D/SNO/14
	218		D/SNO/15
9	258		D/SNO/4
	259	E/Meas./4	D/Meas./10

PAGE CORRELATIONS FOR
DISTRICT TESTS (cont.)

BOOK 2

CHAPTER	AFTER PAGE	TESTS
1	9	C/GRS/1
	14	C/SNO/7
2	48	C/SNO/13
	50	C/SNO/10
3	85	C/SNO/1,2
4	118	C/Sent./1,2
	130	C/SNO/8,14
	131	C/SNO/9
5	144	C/Meas./1
	151	C/Meas./11
	152	C/Meas./10
	153	C/Meas./6
6	---	None
7	193	C/Meas.2,3
8	201	C/Geom./1
	202	C/Geom./7
	206	C/Geom./2
	210	C/Geom./5
	213	C/Geom./4
	214	C/Geom./8 (1-4)
9	219	C/SNO/16
10	234	C/SNO/5
	238	C/SNO/4
	240	C/SNO/3
	248	C/SNO/12
11	270	C/SNO/6
	279	C/SNO/15
	281	C/Sent./3

Extras:

C/Geom./3
C/Geom./6
C/Meas./4
C/Meas./5

PAGE CORRELATIONS FOR
DISTRICT TESTS (cont.)

BOOK 3

CHAPTER	AFTER PAGE	TESTS	
1	3	E/SNO/6	
	8	E/SNO/3	D/SNO/3
	9	E/SNO/2	D/SNO/1
	11		D/Meas./5
	14	E/SNO/1	D/SNO/2
	19	E/Sent./2	
	23	E/SNO/4	D/SNO/16
	24	E/SNO/5	
2	44		D/Sent./2
3	70	E/Meas./5	
	71		D/Meas./12
	75	E/Meas./6	
	83		D/Meas./1,2
4	96		D/SNO/4
	105		D/SNO/5,6
	107		D/Meas./6,7
	119	E/SNO/8	
5	125		D/Meas./9
	130		D/SNO/7
	132		D/SNO/11
	133		D/SNO/12
	137		D/SNO/8
	138		D/SNO/9,10
6	154	E/SNO/12	
	166	E/Sent./1	E/SNO/11
	167	E/SNO/9,10	
	168	E/Sent./4	
	177	E/Sent./1	
7	193		D/Geom./1
	195		D/Geom./4
	198		D/Geom./6
	199		D/Geom./3
	201		D/Geom./5
	202	E/Geom./7	
	208		D/Geom./8
	215	E/Geom./9	
8	217	E/SNO/7	D/SNO/14
	218		D/SNO/15
9	258		D/SNO/4
	259	E/Meas./4	D/Meas./10

PAGE CORRELATIONS FOR DISTRICT TESTS (cont.)

BOOK 3

CHAPTER	AFTER PAGE	TESTS	
10	275	E/Meas./8	D/Meas./16
	276		D/Meas./11
	277		D/Meas./13/15
	282	E/Meas./10	
	283	E/Meas./9	D/Meas./14
	287		D/GRS/1
	289	E/Meas./11,12	
	290	E/Meas./2	
	291	E/Meas./1	
	294	E/Meas./7	
11	307	E/Sent./5	
	326	E/Sent./	
	329	E/Geom./6,10	

PAGE CORRELATIONS FOR
DISTRICT TESTS (cont.)

BOOK 4

CHAPTER	AFTER PAGE	TESTS
1	4	F/SNO/3,4
	8	F/SNO/2
	11	F/SNO/5,6
2	---	None
3	51	F/SNO/18, F/Meas./4,9
	54	F/Meas./8
	57	F/Meas./7
	63	F/Meas./6
	68	F/Meas./10
4	97	F/SNO/12,15
	99	F/SNO/11
	102	F/Sent./3
5	113	F/SNO/17, F/Sent./2
	140	F/Sent./4
6	180	F/SNO/13
7	186	F/SNO/1
	191	F/GRS/1
	210	F/Meas./11
8	---	None
9	249	F/SNO/6,8,9
	251	F/SNO/16
10	---	None
11	282	F/Geom./4
	283	F/Geom./3
	296	F/Geom./9
	302	F/Geom.12
	308	F/Geom./1
12	327	F/GRS/2

LEVEL A

GOAL CARD FOR DISTRICT 60 CONTINUUM OF MATHEMATICAL SKILLS AND CONCEPTS

PUPIL NAME _____ Grade Level _____

SCHOOL _____ School Year 19__/__

OBJECTIVE	Intro.	Mastery
S,N,O - 1: Identify objects that are members of a given set.		
S,N,O - 2: Use one-to-one correspondence to show sets equivalent or non-equivalent.		
S,N,O - 3: Count the objects in a set with ten or less members.		
S,N,O - 4: Draw a set of objects with up to ten objects in the set.		
S,N,O - 5: Read numbers up to ten.		
S,N,O - 6: Write numerals up to ten.		
S,N,O - 7: Write numeral that comes between two given numbers.		
S,N,O - 8: Identify (mark) first (third) object up to fifth.		
S,N,O - 9: Continue a pattern of simple objects, such as: △○□△○□ __ __ __		

OBJECTIVE	Intro.	Mastery
S,N,O - 10: Identify the set which has one more member than the other.		
S,N,O - 11: Demonstrate the concept of addition by joining sets.		
S,N,O - 12: Count in order (by ones) up to 25.		
GEOM. - 1: Ring object that is inside or outside a simple closed figure.		
GEOM. - 2: Identify circle, triangle, rectangle.		
MEAS. - 1: Identify which of two given items (picture, model) is taller/shorter, larger/smaller, longer/shorter, in/on, higher/lower, heavier/lighter, top/bottom, over/under, above/below, left/right, before/after, thick/thin, alike/different, younger/older, more/less, equal/unequal. (Terms not mastered, circled.)		
MEAS. - 2: Identify penny, nickel, dime.		

APPENDIX E

GENERAL VS. DESCRIPTIVE PRAISE

General praise tells the child s/he did something but Descriptive Praise lets the child know exactly what s/he did well or appropriately.

The following are examples that may be difficult to decide whether the praise is descriptive or general, so we have attempted to clarify them.

Examples

A. "You sat down so nicely." (Descriptive)
This tells what the child did. It is a social behavior.

B. "Thank you for reaching your red line." (Descriptive)
"Thank you" will be considered praise from now on.

C. "That is the right answer." (Statement of fact, it is not praise. The words "okay" and "right" are statements of fact, not praise.)

D. "Very good math work." (General) We want you to be more specific than naming the subject.

E. Some examples of Descriptive Praise for academic behaviors in MATH are:

1. "Great, Anthony, your addition problem is correct, $6 + 5 = 11$."
2. "Good work, Marcus, your subtraction problem, $8 - 2 = 6$ is correct."
3. "Regina, your multiplication problem is correct, $6 \times 5 = 30$. You did a fine job in multiplying."
4. "Excellent, $6 \div 2 = 3$. Maurice, you did a great job in solving the division problem."
5. "Thank you, Marvin, for using the abacus to find the sum of your addition problem, $6 + 6 = 12$."
6. "Terrific, Larry, the pie is divided into 4 equal parts."
7. "Beautiful job, Vicki, $<$ that is a less than sign."

GENERAL VS. DESCRIPTIVE PRAISE-Examples (cont.)

8. "Fantastic, Kim, 5 - 3 = 2, and 2 is called the difference."

9. "I am so proud of you, Angela; you regrouped the addition problem correctly. 16 + 15 = 31.

10. "Nice job, David; you used the number line to find the answer to the addition problem, 7 + 8 = 15."

APPENDIX F

MATHEMATICS BACK-UP ACTIVITIES

On the following pages are math back-up activities which were prepared by various teacher aides for use in Behavior Analysis Follow Through classroom.

Math Games and Activities for Token Exchanges

1. Measuring Liquids - Use different size containers; quart, pint, gallon, etc. Decide which holds the most, least, double, etc. (If you used Kool-Aid, the children could drink it afterwards.)
2. Math Puzzles - Let the children fit triangles together to make squares, rectangles, etc. Child could keep his finished puzzle and take it home.
3. Pass the Ball - Use record player. Have children sit in a circle and pass the ball when music is playing. When music stops, the child must read the number or math problem that the teacher holds up. If he fails to do this, he must leave circle. Last one to miss is the winner.
4. Play Store with play money.
5. Follow the Dots Puzzles
6. Indoor Hopscotch - Using numbers or addition and subtraction. For a child to receive pts., he must read number or problem.
7. Numbers in a Bag - Relay race. Let children draw two numbers from a bag and add or subtract them. Give points to team with most correct answers..
8. Treasure Hunt with number clues.

(11/14/72)

Chess Number Game

All students are given some markers.

Make a chess board.

Put numbers on the white space. Cover all numbers. Let students pull a card. If he gets the number correct, he gets a marker--if he gets it wrong, he has to give everybody a marker. If a child runs out of markers before the game is over, he is out.

Speed Racer Game

Submitted by Barbara Hewitt

1. Child spins wheel and advances car that number of spaces.
2. Child answers problem in space. If answered correctly, child child remains on space; if not, returns to space previously occupied.
3. First child to winner's space wins game.

Count Your Change

Suggested by Kathy Wise

COUNT YOUR CHANGE is a Milton Bradley game. It is available for you to borrow, or it would not be very difficult to make your own, or a variation thereof.

Equipment

Play money - (pennies, nickels, dimes, quarters, half dollars, and dollar bills.)

Spinner - Face of spinner is divided into sections labeled with each of the denominations of money included in the game.

Game Board - A grid 10 units long by 10 units wide.

Rules

Each player in turn spins the wheel, and having chosen a column or row on the grid as his/her own, places a coin of the value indicated by the dial on the spinner on one of the squares in his own "territory." Coins of like value may be stacked, one atop the other. The object of the game is to complete a column with coins whose total value is exactly one dollar. If on a given spin, the amount indicated will cause the total value of a column to exceed one dollar, player must begin a new column. Each time a player completes a column, he may exchange his dollar's worth of change for a "dollar" bill. The player who has accumulated the most "dollar" bills at the end of the game is the winner.

56 Help the hunter find the turkey.
Do not cross any lines

SECRET CODE

KEY

A	B	C	D	E	F	G	H	I	J	K	L
1	2	3	4	5	6	7	8	9	10	11	12

M	N	O	P	Q	R	S	T	U
13	14	15	16	17	18	19	20	21

V	W	X	Y	Z
22	23	24	25	26

Match numbers below to correct letters to get the secret message.

10 8 1 14 11 25 15 21 6 15 18

13 15 13 9 14 7. 20 15 3 1 18 13 5 14

9 3 8 13 15 12. 25 15 21 18

10 5 1 3 8 5 18 23 1 14 20 19 25 15 21

9 15 23 15 18 11 8 1 18 4 1 14 4

8 1 22 5 6 21 14.

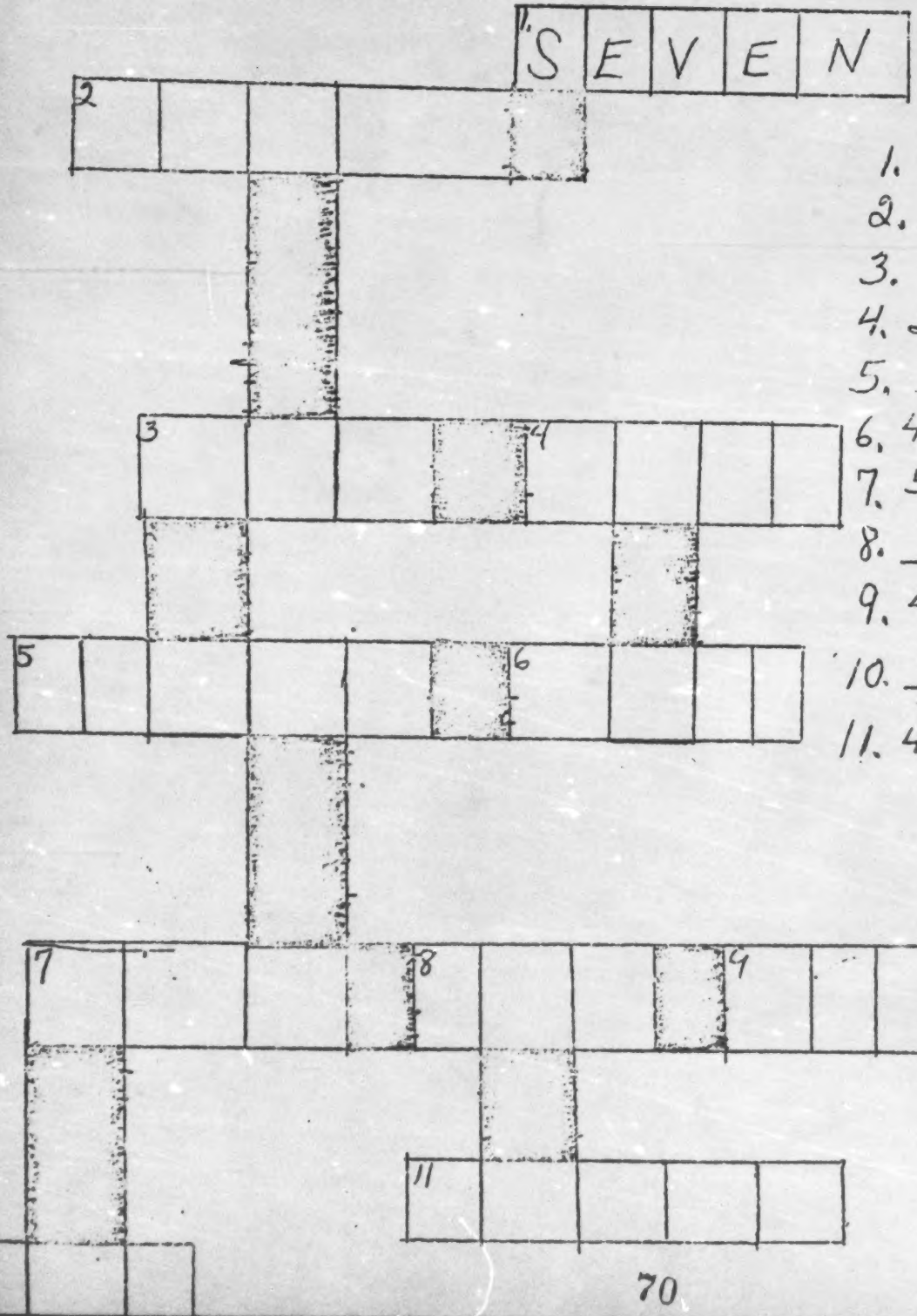
Piggy Bank Game

Suggested by JoAnn Warner

Make up cards with pictures of coins on them. Pennies, nickles, dimes, and quarters. Determine the amount that each person has to have before the game starts. For instance, five cents, ten cents, 25 cents or 50 cents. Deal out all of the cards and keep them face down, turning up only the top card. If the card has the amount determined it is kept. Put it in the piggy bank. If it is not the amount determined, it is put in the middle of the table (pot).

Each one takes his turn and is allowed to use any card from the pot to put with his card to make the amount he needs. This continues until all the cards are used. Each player counts the amount of money he has in the bank. The one with the most money wins the game. This helps with counting money and also finding the missing number.

Complete each row.
Solve the puzzle



1. ___ x 1 = 7
2. ___ x 3 = 15
3. 1 x 1 = ___
4. 2 x ___ = 18
5. ___ x 8 = 24
6. 4 x ___ = 0
7. 5 x 2 = ___
8. ___ x 6 = 36
9. 4 x ___ = 16
10. ___ x 7 = 14
11. 4 x ___ = 32

Bean Bag Math

Submitted by Wanda

Materials: One bean bag

8" by 10" sheets with math problems on them scattered around.

Small pieces of paper for tickets.

Children throw the bean bag and must be able to answer the problem they hit. A ticket is given for each cor- each correct response. The child with the most tickets wins.

Variations:

1. Use answers and the children must recite a problem fitting the answer.
2. Instead of giving tickets, let each child pick up the problem he answered correctly.

King Me (or Queen

Materials: 1 construction paper crown. Chair decorated for a throne.

Cardboard "stones"

Flashcards

Make a path of "stones" leading to the throne. Children advance one stone for each correct response to his flashcard. If he misses, he goes back one. First child to reach the throne is crowned. If time permits, a court may be formed and badges with first attendances, second attendent, etc. may be pinned on the successors to the throne.

Egg Carton Game

Have pockets of egg carton numbered using numbered ping-pong balls - toss for score. Pupil must give sum, difference, or product of the ball and the pocket.

Conductor

Arrange chairs in rows "train fashion." The conductor distributes flash cards to all seats. The conductor then "takes up" the tickets by giving the answers. If he misses, the other child becomes conductor.

Jumping Math

Give a problem, such as 4 + 3, and have the children "jump out" the answer (7) jumps). Subtraction equations may also be used. It also helps to get the wiggle out.

Crackerjack Math

Fold paper into 16 squares. Write in numbers from zero to 18, using each number only once. The teacher calls out a combination such as 2 + 3 or 5 - 2. Anyone who has the answer crosses it out. If they get 4 numbers in a row, they call out Crackerjack. The paper can be used more than once by using different colors and circling numbers.

Number Song

Hold up hands with fingers out. Fold under two fingers at a time as they show the action read. Chant rhyme.

10 little chickadees, staying up so late
2 fly away, and then there are 8.
8 little chickadees, sitting on some sticks:
2 hop away, then there are 6.
6 little chickadees, running to their door:
2 fly away, then there are 4.
4 little chickadees, friends, oh, so true:
2 run away, and then there are 2.
2 little chickadees, days work all done:
Both go to sleep, and then there are none.

APPENDIX G

MATH GLOSSARY

Addend	A number to be added. (In 3 + 2 = 5), 3 and 2 are addends.
Addition	The operation on two numbers called addends to obtain a third number called the sum.
Average	The average of a set of numbers is the sum of the numbers divided by the number of members in the set.
Correspondence	(One-to-one) A system used to match or pair elements of two sets. Two sets are said to be in one-to-one correspondence if each element of the first set is paired with one (and only one) element of the first set.
Counting Number	A number we use for counting: 1, 2, 3, . . .
Digit	The basic symbols of a numeration system used to write numerals are called digits. The digits of the Arabic System are: 0, 1, 2, 3, 4, 5, 6, 7, 8, and 9.
Disjoint Sets	Sets having no element in common are disjoint. For example: (1, 2, 3) and (5, 7) are disjoint sets.
Empty Sets	The set with no members is the empty set.
Equal Sets	Two sets are equal if they consist of exactly the same members.
Equation	A sentence that contains the symbol: = Both 3 + 2 = 5 and 3 = n = 5 are equations.
Equivalent Sets	Sets that can be put into one-to-one correspondence.
Expanded Notation	Notation that shows a number such as 263 expressed as: 200 = 60 = 3; 2 hundreds, 6 tens, 3 ones; or as (2 x 100) + (6 x 10) + (3 x 1).
Inequality	A number sentence containing one of the symbols which says that two numbers are not equal.

MATH GLOSSARY (cont.)

Member	An object in a set.
Metric System	A system of units of measurement based on 10.
Multiple	A multiple of a whole number is a product of that number and any whole number.
Odd Number	A whole number is an odd number if two is not a factor of the number. For example: 1,3,5, and 7 are odd numbers.
Place Value	The value given to a digit because of its position in a numeral.
Place Value System	A system of numeration in which the value of a digit is determined by the place or position it occupies in the numeral.
Prime Factorization	Representation of a whole number as the product of only prime factors. For example: the prime factorization of 12 is 2 x 2 x 3.
Set	A set is a collection of things.
Standard Form	The simplest place value numeral. For example: 342 is a numeral in standard form.
Subset	Set A is a proper subset of Set B if every member of Set A is a member of Set B and Set B has at least one other member. In symbols: A B.
Table Form (of a number)	A table that labels the place value of each digit. for example hundreds tens ones 7 5 3 is the table form of 753.
Union of Sets	The union of two sets is the set that contains all the elements of the two sets. The symbol indicates the union or putting together of two sets as illustrated below: (1,2,3) 3,4,5) = 1,2,3,4,5).

APPENDIX H

FOLLOW THROUGH LANGUAGE

Earn	Period of time Follow Through children are working in academic materials (instruction in books).
Spend	Time to use tokens to buy games and activities in the classroom.
Token	A chip that the teacher gives to the child for good work or good behavior (red and white tokens are equal--used in kindergarten through second grade) which are exchanged for back-up activities.
Exchange	Period when activities are announced, and child counts tokens and chooses an activity.
Back-Up	Activity or game offered during a spend time, and at the end of a contracting period.
Contract	A written agreement between the teacher and student for pages to be done. (Used in third grade only.)
Red Line	A mark to show completion of assignment. Time when a Follow Through teacher questions and asks the child to explain what he/she has done.
Time-Out	Three to five minutes when, because of poor behavior, a child cannot earn or spend tokens (K through second grade), or participate in contracting or backups (third grade).
Prompt	A verbal request from the teacher for a specific academic response.
Target	An individualized preset number of pages, determined by computerized BIPR feedback, that each child is expected to complete in a two-week period.
Red Star	Symbol used in math and reading books to indicate new words, concepts or skills.
BIPR	A Bi-weekly Individualized Program Report completed by the teacher and sent to The University of Kansas (Lawrence) to evaluate student progress and returned to teacher with page targets.

SOME FOLLOW THROUGH LANGUAGE TO HELP

UNDERSTAND OUR PROGRAM (cont.)

Computer Feedback	A Bi-weekly report from The University of Kansas to teacher indicating progress each child has made and his future target.
Contacts	Maintenance: Praises made by the teacher to student who is working independently on math materials during an earn period. Trouble: Student encounters difficulty in materials and raises his hand for teacher's attention. Monitoring: Teacher checks child's skills and teaches additional skills.

BI-WEEKLY INDIVIDUALIZED PROGRESS REPORT (BIPR)

TEACHER : GREEN — PREVIOUS PERIOD : 10 DAYS — PROCESS DATE : DEC
GRADE : 1ST — TARGET PERIOD : 12 DAYS — LAST REPORT : NOV
SCHOOL : CARMAN — SCHOOL WEEK NO.: 14
DISTRICT: WAUKEGAN — WIPR REPORT NO.: 8

STUDENT ID	NAME	ABS	READING DEC 09 PLACEMENT BOOK	PAGE	STANINE	GRADE EQUIV	READING JAN 09 TARGET BOOK	PAGE	RATE	COUR	MATHEMATICS DEC 09 PLACEMENT BOOK	PAGE	STANINE	GRADE EQUIV	MATHEMATICS JAN 09 TARG BOOK	PAGE	RATE
1	MARVIN		7,32	29	*157/74 *		7,120	7+	R16		1,260	18	* 35/22 *		2,4	2+	R
2	MIKA	1	8,78	32	*106/66 *		9,22	7+	R16		1,271	19	* 34/18 *		2,12	2+	R
3	TIM	1	4,120	24	* 80/41 *		5,52	6+	R16		1,232	17	* 38/19 *		1,257	2+	S
4	BRIAN	4	3,47	18	* 40/27 *		3,102	5-	S16		1,139	12	* 13/13		1,164	2+	S
5	ROSALYN		8,18	31	*127/74 *		8,106	7+	R16		1,278	19	* 25/22 *		2,18	2	R
6	SHAWN		4,109	24	* 78/45 *		5,33	6-	R16		1,186	15	* 25/22 *		1,212	2+	S
7	LATISHA	1	5,12	25	* 63/37 *		5,106	8-	R16		1,195	15	* 24/19 *		1,220	2+	S
8	URSULA	1	6,111	28	* 87/66 *		7,55	7+	R16		1,264	19	* 35/19 *		2,7	2+	R
9	TRENT		7,114	30	* 90/74 *		8,58	7+	R16		1,261	19	* 57/21 *		2,5	2+	R
10	BETH	2	5,113	26	* 75/59 *		6,57	7+	R16		1,203	16	* 23/17 *		1,228	2+	S

WEEKLY PROGRESS REPORT

TEACHER GRADE

ID	NAME	READING BK	READING PAGE	MATH BK	MATH PAGE
1	Marvin	7	32	2	4
2	Mika	8	78	1	271
3	Tim	4	120	1	232
4	Brian	3	47	1	139
5	Rosalyn	8	18	1	278
6	Shawn	4	109	1	186
7	LaTisha	5	12	1	195
8	Ursula	6	111	1	264
9	Trent	7	114	1	261

THE ACTIVITY WHICH IS THE SUBJECT OF THIS REPORT WAS SUPPORTED IN WHOLE OR IN PART BY THE U.S. OFFICE OF EDUCATION, DEPARTMENT OF HEALTH, EDUCATION AND WELFARE. HOWEVER, THE OPINIONS EXPRESSED HEREIN DO NOT NECESSARILY REFLECT THE POSITION OR POLICY OF THE U.S. OFFICE OF EDUCATION, AND NO OFFICIAL ENDORSEMENT BY THE U.S. OFFICE OF EDUCATION OR THE ILLINOIS OFFICE OF EDUCATION SHOULD BE INFERRED.